Writing with a Digital Upgrade:

Using Wikis to Enhance the Six Traits of Writing

Action Research Project CI 515

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Introduction

Writing is an essential cornerstone of the three "R's" of education: reading, writing, and arithmetic, but in many classrooms, it tends to be the neglected "R". Fry and Griffin (2010), report standardized tests show less than one-third of American K-12 students are proficient in writing. It is a common goal of elementary teachers to produce articulate writers who are capable of communicating their ideas clearly, but with the emphasis on reading in elementary schools, less time is being spent on writing instruction. Evidence across the nation shows that children are not developing the writing skills necessary for adulthood, even though writing skills are essential for an increasing number of jobs (Executive Office of the President, 2009; National Commission on Writing, 2006). According to the Executive Office of the President (2009), "Employers judged nearly three-quarters of high school graduates as unable to write at a basic level, for which competency includes knowledge of both spelling and grammar" (p. 11).

In the past decade, educators have tried to increase the quality and amount of writing produced by utilizing technology throughout the writing process. Word processing has been one way in which educators have tried to increase the quality and instruction of the writing process but with little success (Ulusoy, 2006; Warren, Dondlinger & Barab, 2008). One positive use of word processing is students who use this technology have produced longer compositions with more words and sentences than students using paper and pencil (Ulusoy, 2006). Van Leeuwen and Gabriel (2007) have recognized that word processing supports the writing process as it motivates students to write and can complement writing, but the technology itself did little to change the quality of the writing.

Other educators have used technology to increase writing quality with assistive technology for underachieving students and students with special needs. Specifically designed

computer programs that assist writers have shown positive effects on student behaviors and written products but the changes have been mainly on spelling and organization of writing rather than content revisions (Englert, Wu, & Zhao, 2005; Gnash, Wiesner, Bertschi-Kaufman, & Perrin, 2007; Zhang, 2000).

There has been little research conducted that investigates the impact technology has had on the quality of students' writing with emphasis on revising the content of student writing at the elementary level. With today's Web 2.0 tools, it is essential to embrace more of what technology has to offer than just word-processing and assistive technologies. Because of technology, students now can write collaboratively and synchronously with their peers.

The action research model utilized to complete this project was the Dialectic Action Research Spiral described by Mills (2011) and illustrated in Figure 1.

An area of focus was developed by conversations during a third grade Professional

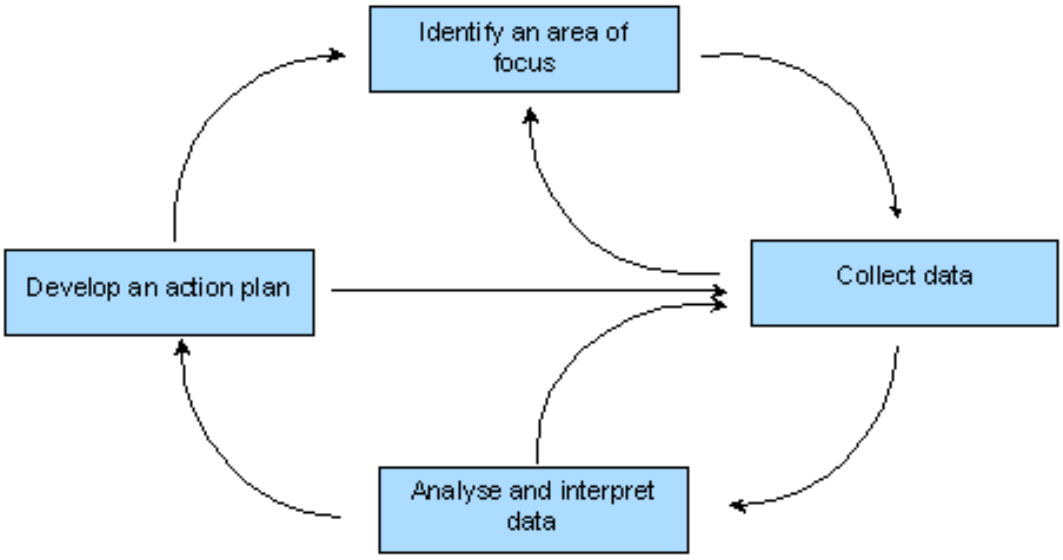

Figure 1. Dialectic action research spiral (Mills, 2011, p.19)

Learning Community Meeting within the school. To examine the effectiveness of using peer feedback through the use of wikis, third grade students published two narrative pieces of writing in four weeks. The baseline paper was completed only using paper and pencil using the traditional writing process (prewriting, drafting, revising, editing, and publishing). The intervention piece used a wiki environment throughout the writing process. The two pieces were evaluated with the same rubric (Six Traits of Writing) and compared to see if the use of the feedback from peers within the wiki setting impacted the quality of the six traits of writing (i.e. ideas, organization, word choice, voice, sentence fluency, and conventions). Analysis and interpretation of data are reported in the findings sections of this paper. An action plan for how this research may be utilized by other educators and suggestions for future use of wikis within a third grade writing classroom are also included. The next section of this paper will describe the area of focus statement, the objectives, and how they were developed in further detail.

Area of Focus Statement

The purpose of this study examined the effects of using a wiki environment with third graders and evaluated the students' application of the Six Traits of Writing (i.e. ideas, organization, word choice, voice, sentence fluency, and conventions) by using a wiki.

The main objectives of this action research project were:

- to explore how a wiki environment can be used to support elementary students' use of the Six Traits of Writing in their compositions and revisions.
- to study how students engage with idea development, composition, and revision within the wiki environment.

- to evaluate what type of writing revisions are suggested by peers.
- to discuss the role of wikis in developing the writing skills of elementary students based upon the Six Traits of Writing.

The research questions arose through the a conversation between the third grade Professional Learning Community team about the lack of quality in the writing of their students. Many of the teachers noticed that the students would write a draft and consider their writing complete, rather than improving their writing by working through the writing process. The main areas that the students were skipping in the writing process were the revision and editing stages. When students were editing, they were usually just fixing grammatical errors, rather than evaluating the content of the writing. After doing some research, using peer feedback with technology (i.e. blogs and wikis) seemed to be an effective way to getting students to revise and edit their writing.

There had been some research conducted showing the effectiveness of using technology to enhance writing, but most of this research included word-processing (Bangert-Drowns, 1993; Ulusoy, 2006; Van Leeuwen & Gabriel, 2007) or assistive technology (Englert, Wu, & Zhao, 2005; Gnash, Wiesner, Bertschi-Kaufman, & Perrin, 2007; Peterson-Karlan, Hourcade, & Parette, 2008; Zhang, 2000). Little research has been done about using wikis to support the writing process or the Six Traits of Writing. There had also been some research conducted on using wikis to enhance student learning in areas such as geography, engineering, and science, but most of the research has been conducted at the secondary level (Chu, 2008; Lundin, 2008; Mak & Coniam, 2008; Morgan & Smith, 2008; Parker & Chao, 2007). Whether these findings of using wikis to support student learning, especially in the area of writing, are applicable to

students at the elementary level still needed further research. The following part of this paper will show the research questions developed for this action research project.

Research Questions

- How will 3rd grade students' writing (e.g., ideas, organization, word choice, voice, sentence fluency and conventions) be impacted by using wikis during the writing process?
- What are 3rd grade students' perceived benefits and challenges of using a wiki during the writing process?
- How does the feedback that 3rd grade peers give, during the writing process, change with the use of a wiki compared to without the use of technology?

Review the Related Literature

Introduction

This literature review will examine studies which have focused on increasing the quality of elementary students' writing, specifically with using the Six-Trait Writing model to instruct and analyze student writing, as well as using a wiki environment to revise and edit the content of student writing. Motivation of students while using technology effectively will also be examined. With daily instruction of the Six Traits of Writing, in conjunction with using a wiki environment throughout the writing process, the quality of writing produced by elementary students will be further explored.

The Need to Improve the Quality of Writing

In response to the perceived neglect of writing in today's schools, The National Commission on Writing (2006) proposed that several action steps need to be embraced to reform writing in U.S. education. These steps state that schools need to: (1) double the amount of time students spend writing, (2) assign writing across the curriculum, (3) encourage out-of-school writing, and (4) employ technology to help improve writing. Students are leaving school without the ability to write effectively; therefore, it shows students have not been taught how to write effectively.

To address the first action step suggested by the National Commission on Writing (2006) researchers suggests that having a comprehensive model of daily classroom writing, with rubrics, produces more proficient writers (Montague, 1990; Romeo, 2008). Traditionally, most teachers have emphasized the writing process of pre-writing, drafting, revising, editing, and publishing with little emphasis on the quality of each step. Ulusoy (2006) states, "All good writing moves through an authoring cycle that begins with thinking about or discussing the topic and making pre-writing notes. After the pre-writing, writers can work on writing as an initial draft. When writers revise and edit, they can take their peers' teachers' and editors' ideas about the papers" (p. 58).

According to Dunn and Finley (2010), "For students who struggle with composing text, the writing process can be an arduous challenge which often results in frustration and a final copy which is lower in quality than standards dictate" (p. 33). To produce a quality story that fits expectations and moves through a logical sequence of events with a rising action, crisis and climax, and a final resolution, students need to demonstrate command of writing practices which

can be developed with the use of the Six Traits of Writing, which will be further explained in the following section.

Six Traits of Writing

The Six Traits of Writing emphasizes developing the following traits in student writing throughout the writing process: ideas, organization, voice, word choice, sentence fluency and conventions (Culham, 2003). Culham (2003) explains that students first focus on getting their ideas developed and organized, then move into revising with a strong voice and word choice, examine their sentence fluency and conventions while editing, and finally publish a quality piece of writing.

Empowering students with the knowledge and application of the Six Traits of Writing on a daily basis allows students to develop their writing skills and not focusing solely on the conventions as typically observed in writing classrooms. The Six Traits Model has been proven effective in small-scale studies (Fry & Griffin, 2010; Kozlow & Bellamy, 2004), as well as in large-scale effectiveness studies (Coe, Hanita, Nishioka, & Smiley, 2011). The study conducted by Coe et al. (2011) has shown students using the Six Traits of Writing produce better quality writing. When using a quantitative measure, students using the Six Traits of Writing method significantly exceeded those in the control group in all six measures. The Six Traits of Writing has shown positive results in students' writing skills, but it does not measure editing marks or the revisions made by the students. The following section will further examine editing and revising at the elementary level.

Editing and Revising by Elementary Students

Research has shown, when given the time to write and revise work to create better quality stories, elementary students typically will not change their writing pieces at all. If they do make changes, the changes they make are conventions. They tend to not change or develop the ideas they are writing (Coe et al., 2011). Other researchers have also claimed that elementary students have not developed the cognitive ability to make content area revisions in their writing, nor recognize the need for revision (Beal, 1996; Butterfield, Hacker & Albertson, 1996; Dix, 2006). Graham, McArthur and Schwartz (1995) have observed that young students' revisions were limited for several reasons. These reasons includes students' failure to define goals and intentions, inability to evaluate text as a reader, lack of understanding on what needs to be modified and how to modify it, and lack of knowledge and control necessary for revisions.

Although most studies that involve elementary students show their lack of revisions or solely surface level changes, there is some evidence that students in elementary schools can revise content with depth and clarity (Chanquoy, 2001; Pifarre & Fisher, 2011; Woo et al., 2011). These studies used technology, specifically wikis, to promote a community of students which support revising and editing, with students at the elementary level (Allsup, 2011; Pifarre & Fisher, 2011; Woo et al., 2011). According to Gnash et al. (2007), students become more aware of the writing process itself when using a computer to write. With web-based interactive writing environments, students can review their work and writing can be used for enhancing peer assessment in social learning. Whether using technology or not, teachers need to emphasize the need for children to review and revise their work, and create an environment that encourages revision (Beal, 1996).

Using the Six Traits Model as the only means to improve writing will not meet all of the suggestions from the National Commission on Writing (2006). The Six Traits of Writing, as well as focusing on editing and revising, include ways to increase the quality of writing, but do not meet a couple suggestions - writing across content areas, requiring out-of school writing or employing technology to improve writing. According to some research, technologies such as wikis, which are online collaborative writing tools, have the possibility to meet these requirements as suggested by the National Commission of Writing (Allsop, 2011; Mak & Coniam, 2008; Pifarre & Fisher, 2011; Woo, Chu, Ho, & Xuanxi, 2011). Technology has been shown to impact student motivation to write, which will be further examined in the following section.

Motivation to Write with Technology

There have been multiple studies showing that students are motivated by the use of technology. By providing peer-feedback in an online environment, students recognize their audience is larger than just the teacher. Audience awareness is heightened when using an online environment, as shown in Baker, Rozendal and Whitenack's (2000) study using blogs: elementary students enjoyed having the opportunity to be an author and have a large interactive audience, in which the author receiving solicited and unsolicited feedback.

This was not the only study conducted that received positive feedback on using technology to motivate students to write. Students, even at all levels, enjoy being able to collaborate with their classmates and get peer-feedback while using a wiki (Clark & Dugsdale, 2009; Morgan & Smith, 2008; Pifarre & Fisher, 2011; Woo et al., 2011; Zammit, 2010). In the qualitative study conducted by Woo et al. (2011), elementary students enjoyed the educational

affordances, but emphasized the social and collaborative affordances as being their favorite part of the study. The next section of the review of literature will go into further detail about using wikis with elementary students.

Elementary Students Writing with Wikis

The use of wikis in the elementary classroom represents a new approach to teaching writing that is developing and changing on a daily basis. The fourth expectation of the National Commission of Writing (2006) is to use technology to enhance writing. It may be helpful to determine how using wikis in the elementary classroom might impact student writing. Wiki, meaning "quick" in Hawaiian, is an online, digital application that enables contributors to add or to amend information (Morgan & Smith, 2008). Wikis, like blogs, enable writers to post their thoughts online and, if they so choose, to collaborate with other writers. Morgan and Smith (2008) describe wikis as collaboratively authored, searchable documents with internal and external links. Dobson (2007) states that wikis allow communities of users to add or edit web pages very easily using any browser on any machine without any previous knowledge of the more challenging aspects of web design. Because of its simplicity of use and open philosophy, a wiki has been described widely as a publishing tool that users may use to edit one another's pages. They may even add or remove links and pages, images and text.

For classroom purposes, wikis are designed to be created and used by multiple students. Wiki authors can add and change text, images, and tables easily with a click of the edit button. They are user-friendly, as they look like software used for word processing; therefore, young writers can use a wiki environment easily. Access to all parts of a wiki can be controlled by the teacher. Changes in the wiki can be tracked and compared with earlier versions of the same

document. These previous versions can then be retrieved and returned to by the students in case of an accidental change or error (Morgan & Smith, 2008).

Multiple studies have shown that use of wikis is increasingly gaining in popularity in educational settings because of the potential benefits they bring to teaching and learning (Clark & Mason, 2008; Fitch, 2007; Nordin & Klobas, 2006). In all content areas, wikis allow students to work together to reach a common goal and create in a social setting with proper guidance from the instructor. With wikis, minimal technical training is needed, and "content is ego-less, time-less, and never finished" (Lamb, 2004, p. 37). Furthermore, several researchers have observed that traditional notions of authorship and ownership of ideas can be radically altered within a wiki environment (Coley, 2007; Dobson, 2007; Lamb, 2004; Mak & Coniam, 2008; Vratulis & Dobson, 2008).

When used for writing production, wikis give students a sense of how the writing can be a collaborative exercise. Students need to agree on the structure and content of the wiki, and the methods that are necessary to accomplish collaborative writing. In these ways, wikis help to build mutually beneficial communities of writers (Vratulis & Dobson, 2008). When collaborating, students can either work together to compose a collaboratively authored document, or they can help each other through the writing process in documents produced by single authors. When focused on student writing growth, wikis can transform writing to be a more social, collaborative, and reflective task in which peers can support one another in their development as writers.

Wikis are mainly used for group writing projects in which students collaborate by creating and editing content together (Forte & Bruckman, 2006; Lee, 2010; Lundin, 2008; Pifarre & Fisher, 2011). These studies had groups of students create one piece of writing from the

beginning of the writing process to publication. Throughout the process, students discussed content, revised and edited work, and then created one final product. Results of these studies showed positive responses to the wiki environment, as well as an increase in the quality of writing.

Very few research studies have been conducted with elementary students using a wiki. Much of the research conducted in the elementary setting on using wikis to enhance writing performance has been studied outside of the United States (Allsup, 2011; Pifarre & Fisher, 2011; Pifarre & Staarman, 2011; Woo et al., 2011). These studies concluded that elementary students have the ability to use wikis as a dialogic space to think together. Elementary students can collaborate within the discussion space, create on the wiki page, and revise and edit all in one spot. Students have the potential to produce a strong collaborative piece that through editing and revising, create a longer, more rich and complex text.

In Pifarre and Fisher's study (2011), results indicate that the writing process can result in an overload for young writers; therefore, breaking up the process by the use of a wiki environment has proven an effective way to use a wiki with young writers. Students were able to see what errors they initially made and the young writers took advantage of the opportunity to be fully engaged in the revision processes. Students made both surface changes, as well as changes in the content, when using a wiki. The wiki environment supports students' use of composition and revision strategies, emphasizing both surface and text-based changes while revising (Pifarre & Fisher, 2011).

Wikis do not only have to be used for writing, but fit well into other content areas as well. Referring back to the recommendations put forth by the National Commission on Writing (2006), this report suggested that writing be assigned across content areas. Studies have

supported using wikis for developing higher order thinking skills, at the elementary level, in multiple content areas such as science exploration (Pifarre & Staarman, 2011), Spanish development (Lee, 2010) and researching Antarctica (Zammit, 2010). Most of the literature exploring the use of wikis in education in all content areas primarily focuses on using wikis in secondary and higher education settings (Chu, 2008; Lundin, 2008; Mak & Coniam, 2008; Morgan & Smith, 2008; Parker & Chao, 2007). This research concludes that wikis have positive results on students, as it was determined students evaluated and collaborated more. It is worth noting that much of this research was qualitative so the impact of student achievement was not necessarily measured.

Some studies have found challenges related to using wikis within classrooms, but most have been from the secondary or college level. Carr, Morrison, Cox, and Deacon (2007) concluded in their study that some students were reluctant to use wikis for course work. Many felt that using the wiki was too time consuming for the end result. Elgort, Smith, and Toland (2008) indicated that a significant numbers of students thought that they could have completed the task better on their own, although wikis are designed to facilitate collaboration among students. On the other hand, even if students do see the potential of wikis, using a wiki setting does not automatically ensure collaboration. Instructors must facilitate discussion and promote collaboration amongst the students.

To address the third action step suggested by the National Commission on Writing (2006), in which teachers should encourage out-of-school writing, wikis can be used to reach this action step. Since wikis are web-based tools, students have access to their writing at any time as long as they have Internet access. Having instant access to their writing students have shown to access their work outside of the school day. According to Zammit's (2010) qualitative study,

students believed the best aspect of using the wiki was the ability to work in different location, not just at school.

The use of wikis in the educational setting is a fairly new idea, but is gaining support as an effective way to promote writing, collaboration, and revising. Students now have instant access to their work and a wiki provides increased motivation for students to write. As technology becomes more prevalent in the educational setting, Web 2.0 tools (i.e. wikis) are viable alternative learning tools as their format promotes higher-order thinking skills such as collaboration and revision.

Summary

This literature review presents the findings of assumed research conducted on the writing process, the six traits of writing, editing and revising, and the results of using a wiki in the educational setting. A wiki is one example of a Web 2.0 tool that can assist and augment the creative writing process in a number of ways. The research thus far suggests that wikis can facilitate the writing process by increasing student motivation; fostering revision and editing experiences; providing instant access to writing and editing via the internet; as well as supporting collaboration between peers and teachers.

It is essential to understand that technology cannot replace a teacher, as Woo et al. (2011) state, "Although a wiki may provide affordances for writers to focus on content and revisions, it is not automatic, and a teacher's instructional role is still important in scaffolding students by teaching them the appropriate skills" (p. 53). Although technology cannot replace the teaching of writing content, the marriage between a wiki environment along with effective instruction of the Six Traits of Writing can support the creative writing process and provide students with a much

wider editing team and audience than most print formats. As research suggests, students will be able to collaborate, revise their stories, and be motivated along the way.

Most of the current research using wikis has occurred in the secondary or post-secondary levels at multiple disciplines; however, whether or not these finding are applicable at the elementary level needs further investigation. All of the studies using wikis to promote writing that were conducted at the elementary level have been outside of the United States. The possibilities of using wikis to revise with peers to increase the quality of writing with young writers are virtually unexplored with American students. The opportunity for easy collaboration along with the ability to track revisions are a few reasons wikis could transform writing and should be more readily adopted into the American elementary school writing curriculum. The next section of this paper will describe the intervention of using wikis in writing at the elementary level used for this action research project.

Intervention

This research project presented the findings of previous research conducted on the writing process, the Six Traits of Writing, and the results of using a wiki in the educational setting. A wiki is one example of a Web 2.0 tool that can assist and augment the creative writing process in a number of ways. The research thus far suggests that wikis can guide the writing process by collaborating with peers and teachers; increased motivation; instant access to writing and editing via the internet; as well as more extensive revision and editing. Most of the current research using wikis has occurred in the secondary or post-secondary levels, leaving the elementary setting with very little research on the possibilities of using wikis to increase the quality of their writing. The opportunity to use a wiki environment for easy collaboration, along

with the ability to track revisions, is why wikis should be more readily adopted into the elementary school writing curriculum.

To further this study, third grade students published two narrative pieces of writing within a four week time period. The baseline paper was completed only using paper and pencil using the traditional writing process (prewriting, drafting, revising, editing, and publishing). The intervention piece was developed within a wiki environment, in particular *Wikispaces*. The two pieces were evaluated with the same 6-Traits of writing rubric to determine if the wiki setting impacted the quality of writing (i.e. ideas, organization, word choice, voice, sentence fluency, and conventions).

To examine the effect of feedback while using the wiki, students each had their own wiki page to compose their intervention writing piece. After composing, the students were responsible for providing each other feedback on the wiki to clarify and improve each other's writing. The students used the discussion post feature of the wiki to provide the feedback to one another. The researcher then compared the baseline writing piece to the intervention piece to see the types and frequency of feedback from peers.

The following section will provide details about the context and participants in this action research project.

Membership of Action Research Group

Demographics

Research for this study occurred in a rural school district in the Midwest. There were approximately one thousand students enrolled in the K-12 school district. This community had a low socio-economic status, with the average household income under $30,000.

Demographically, the student body was over 90% Caucasian with over 60% qualifying for free and reduced lunch. The research specifically occurred in the district's intermediate elementary school that housed approximately 400 students in grades, two, three, four and five for the 2011-2012 school year.

Participants

Students

In the third-grade classroom where the research was conducted, the students were between the ages of eight and ten with 60% of the students being male and 40% female. Of the 21 third grade students, there was one student that has been identified for the talented and gifted program, two students who participated in the Title I reading program, and six that had individualized education plans for reading and language. Eleven of these students had also been diagnosed with attention-deficit disorders. Students, in the specified class, were taught with small group instruction for Reading and Math based upon their pre-tests and individual needs. The average reading level for this class was 2.8 grade level based upon standardized tests.

Researcher

The researcher in this action research study was also the classroom teacher. She has been teaching in this same community for eleven years, all at the elementary level. Currently, the researcher is a full-time teacher and also a graduate student at Iowa State University. The researcher is obtaining a Master's Degree of Education in Curriculum and Instructional Technology. She currently has her Bachelor's of Arts Degree in Elementary Education with a Reading endorsement and has been trained in the Six-Traits of Writing.

Availability of Technology

The classroom had an interactive whiteboard and projector, three student desktop computers, and access to a mobile lab with ten laptops. The elementary school also has three permanent desktop labs, each containing twenty-five computers, which are available for class use. The students had a familiarity of using technology, especially with blogging their writing on a weekly basis. The students had also previously participated in a wiki environment, in which they collaborated with students in another classroom, during a science unit conducted earlier in the year. By having a strong background in the use of technology in their writing with blogging and participating in a wiki previously, the marriage of these two experiences allowed for an easy transition for the third grade students.

Negotiation to be undertaken

To be ethical and protect the rights and welfare of the participants, the researcher asked the permission of the school principal and superintendent to conduct this action research project within one of the third grade classrooms in the district. They both gave informed consent giving permission to conduct this research, as well as to collect and analyze data for this project.

Students and parents were also informed about the project throughout the study but were not required to give consent to participate in this action research study. The next section will show the timeline of events planned to complete this action research project.

Timeline

This research project was a short-term study conducted in one semester in a third grade classroom. The steps, which included the phases of development for this project including: planning, implementation of the innovation, analyzing the data, preparing further research and presenting the implications with stakeholders for this action research project. Further details about each step of the action research process are listed in Table 1.

Table 1

Timeline of Events

Phase	Dates	Details
Phase 1	January - March	identified area of focus, developed research questions, reviewed related literature, wrote draft of literature review
Phase 2	March 7 - April 6	created survey, collected and analyzed data, worked on action research plan: introduction, intervention, membership, negotiations, timeline
Phase 3	April 6 - April 21	finished analyzing data, revised literature review, interpreted and reported the findings
Phase 4	April 22 - April 27	prepared an action plan for further study and recommendations, completed action research project and presentation, shared with stakeholders

Data Collection and Analysis

This section of the research project will explain how data were collected and analyzed to answer each of the research questions. Multiple forms of data were collected as seen in the triangulation matrix (see Table 2). The matrix is organized by each research question addressed in the action research project and what sources the researcher used to gather data to answer each question.

Impact of wiki on the 6-Traits of Writing

To answer the first research question of how third grade students' writing would be impacted by using wikis during the writing process, a rubric was used to evaluate student writing without the use of technology. The researcher created the rubric (See Appendix A) on the Rubistar website. The rubric was based upon Culham's (2003) Six-Traits of Writing, as well as the expectations of the designated curriculum to evaluate student writing. The writing was evaluated on a four-point scale with four being a high level of application for each of the six

Table 2

Triangulation Matrix - Sources used to collect data

Research Questions	Data Source 1	Data Source 2	Data Source 3
Impact of wiki on 6-Traits	Pre 6-Traits Rubric	Post 6-Traits Rubric	
Perceived Benefits and Challenges of using a wiki	Student survey Post wiki use	Observation Field notes	
Feedback from peers with wiki	Surface level versus content area data Pre-Wiki	Surface level versus content area data Post-Wiki	Observations/Video Transcriptions

traits. The first piece of writing evaluated was referred to as the baseline piece and was approached as a pre-test. This piece was written with only paper and pencil and students used the traditional writing process to complete the piece. The second piece of writing evaluated, which was created on the wiki, was the intervention piece and was approached as the post-test.

To increase validity in the study, the researcher focused on inter-rater reliability to make sure there was agreement between the scorers using the rubric. When analyzing the pieces of writing, the researcher and another teacher within the district, who had been trained in the Six-Traits of Writing, evaluated pieces individually with the use of the rubric and then compared results. Since the evaluations were similar for the first four pieces, the researcher was the sole evaluator of the remaining pieces. The data gathered from the rubrics were placed in a spreadsheet and were evaluated with quantitative measures such as a two-tailed paired independent-samples t-test to see if there were significant changes in the mean of the data collected.

Perceived Benefits and Challenges of Using a Wiki

To determine the perceived benefits and challenges of a wiki, students completed a survey on Google Forms (See Appendix B) after using the wiki throughout the writing process. The open-ended questions asked students their perceptions of using the wiki for writing. They were asked to explain the best part of using the wiki, the most challenging part of using the wiki, and how their writing changed with the use of the wiki.

The researcher also took field notes (see Appendix C) while observing students working on the wiki. The researcher wrote anecdotal notes, as well as video recorded students' actions as they worked on the wiki. The researcher transcribed the notes and video and reviewed these data

to determine if there were other benefits, challenges, or changes made which the students did not add into the survey. These qualitative data were then coded along with the survey to determine commonalities found in the benefits and challenges of using a wiki during the writing process.

From the qualitative data collected from the survey and the field notes, the researcher analyzed responses by means of a coding scheme, searching for commonalities in student responses. Foss and Waters (2003) explain the process of coding data by looking for things pertinent to answer research questions, developing and labeling themes, developing a conceptual schema for the data, and writing up the analysis. The researcher color coded responses by highlighting the narrative data according to how the student responses related to the research questions. Data with the same color were grouped together by common categories to see which categories were most apparent in the data collection. After the data were grouped into themes, the researcher examined the data several times, developed a central schema for each theme, and wrote up the analysis, which will be presented in the findings section of this paper.

Types of Feedback from Peers

Taxonomy of Revisions

To address the third research question of how feedback during the writing process changes with the use of a wiki compared to without the use of technology, the researcher analyzed the types of feedback students provided each other on both pieces of writing. To analyze the feedback, the researcher used the theory of taxonomy of revisions (See Figure 2) created from previous studies conducted by Faigley and Witte (1981) and Dix (2006) to create a similar model of comparing surface level revisions to those of text based changes.

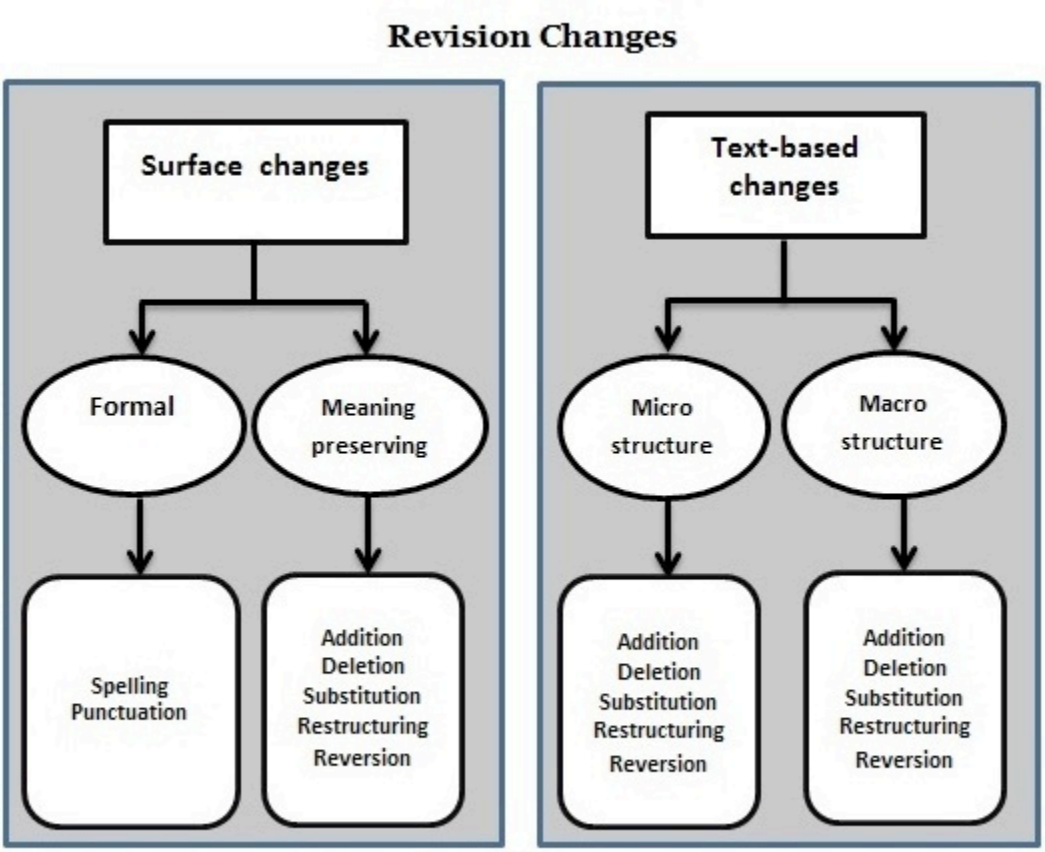

Figure 2. Taxonomy of Revision adapted from Faigley and Witte (1981) and Dix (2006)

The researcher did not determine it necessary to have three layers of revisions for this action research study. Rather than evaluating each layer as suggested by Faigley and Witte (1981) and Dix (2006), the researcher eliminated the second layer of the model and bundled all of the surface level changes into one category and all of the text-based changes into another category as shown in Figure 3.

If the changes did not impact the meaning of the writing piece, it was labeled as a surface level change such as inserting a descriptive word or changing the spelling. If the change did impact the context of the writing, it was labeled as a text-based change such as elaborating on ideas or changing the organization of the piece. The researcher used this adapted taxonomy to evaluate peer-revisions on the baseline writing piece and again on the intervention writing piece.

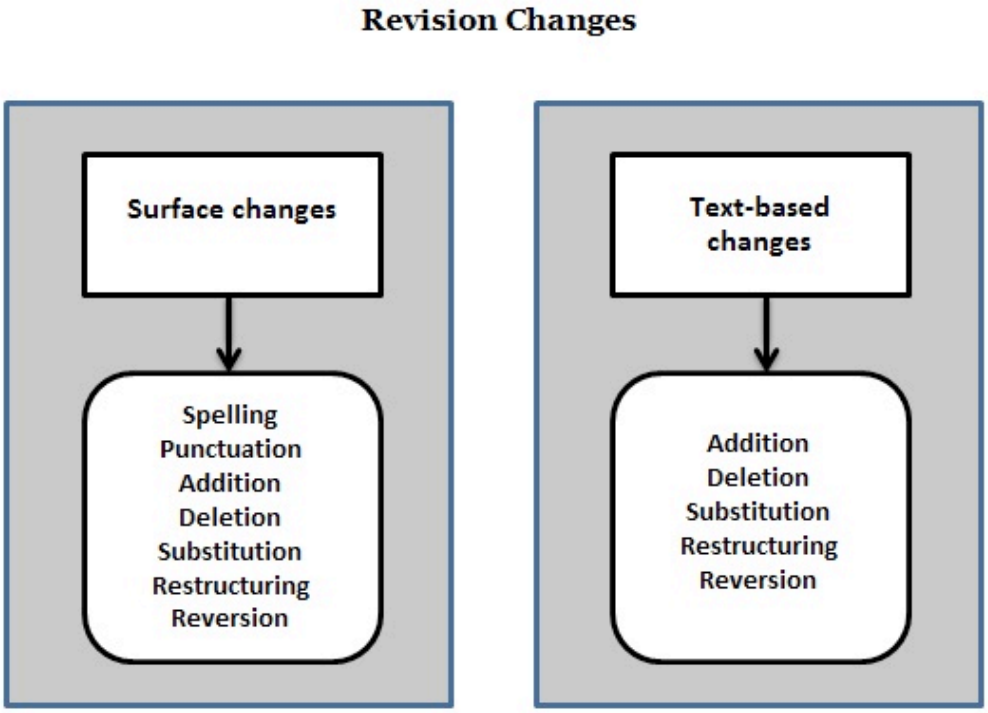

Figure 3. Adapted taxonomy of revisions

Revisions without technology

The baseline piece required the researcher to collect and examine each student's writing piece, as well as tally the number and types of changes students suggested while peer editing. The students were required to write in pen any suggestions for changes they gave to their peers while peer-editing. They used editing marks while proofreading and wrote narrative suggestions for text-based changes. The researcher compiled the results for each student's baseline piece of writing in a spreadsheet.

Revisions with wiki

When students completed their composition on the wiki, peers were encouraged to provide feedback to improve each other's writing. The students used the discussion post feature

provided on the wiki to give suggestions, editing changes and ideas for changing or improving writing (See Figure 4). The students would use the discussion posts to respond to each other for clarification on improvements. The researcher examined each student's discussion posts for the type and frequency of revisions. The data were then compiled into the same spreadsheet as the baseline piece. The researcher compared the types and frequency of revisions using quantitative measures.

Field Notes

To increase the validity of the research, the researcher compiled field notes and video recorded students three different times during the two week intervention period. The data compiled from the field notes and observations were further examined to determine if feedback was given in any other manner than just on the discussion boards of the wiki. After collecting

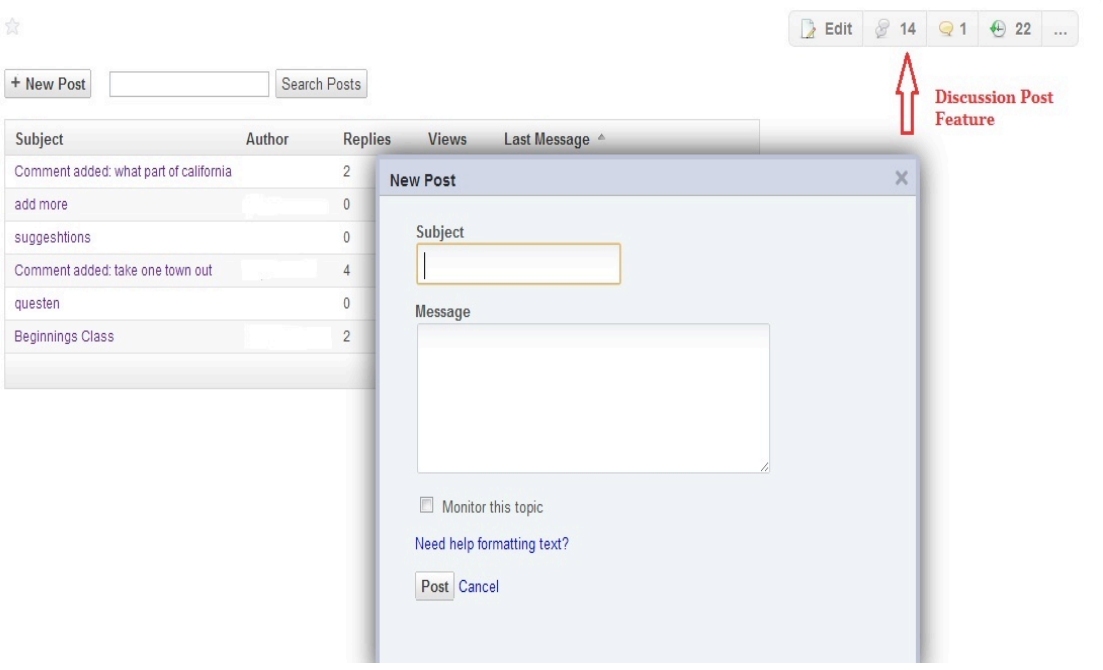

Figure 4. Discussion Post Feature

and analyzing the data pieces, the researcher determined many significant findings of this action research project which will be presented in the following section.

Findings

This section presents the findings of the data analysis to address the three research questions presented in this action research project. The findings are organized according to the research questions.

Results From the Impact of a Wiki on the 6-Traits of Writing

To answer the first research question of how third grade students' writing (e.g., ideas, organization, word choice, voice, sentence fluency and conventions) would be impacted by using wikis during the writing process, the researcher referred to the Six trait rubric and the quantitative measures gathered from the compilation of the data. By comparing the results of the baseline writing piece to the intervention piece, significant growth in writing became evident as presented in Appendix D. An independent-samples t-test was conducted to compare the Six Traits of Writing in the baseline writing piece to the intervention piece.

First, an overall analysis of the total traits scores was conducted to determine whether differences existed that might be attributable to the intervention. When examining the independent samples t-test on the use of the Six-Traits of Writing, there was a significant difference between the baseline writing piece (M=10.61, SD=3.65) and the innovation piece (M=16.33, SD=4.40) t=<.01, p=<.05. The results were significant in all aspects of the Six-traits of writing.

Ideas

The trait of ideas refers to the development of the main idea and details of the story, as well as staying on one topic. When examining the independent samples t-test on the trait of Ideas, there was a significant growth in this area when comparing the baseline writing piece (M=1.52, SD=0.68) and the innovation piece (M=2.48, SD=1.08) t=<.01, p=<.05.

Organization

Organization refers to the ability to create a beginning, middle, and end of a story, having the order make sense, as well as adding transitions. When analyzing the independent samples t-test of the Organization trait, there continued to have a significant difference between the baseline writing piece (M=1.43, SD=0.81) to the intervention writing piece (M=2.67, SD=0.85) t=<.01, p=.05. This was the trait with the largest area of growth in the mean scores.

Word Choice

Word choice refers to the type of words used in writing, with the ability to apply powerful and engaging words that help paint a picture of what was written. When examining the independent-samples t-test, there was significant growth in the means between the baseline writing piece (M=1.95, SD=0.67) and the innovation piece (M=2.90, SD=0.94) t=<.01, p=<.05.

Sentence Fluency

Sentence fluency refers to the flow and rhythm of sentences, with the ability to vary the length of sentence and for the reader to read the text with ease. When examining the

independent-samples t-test, there continued to be significant growth between the baseline writing piece (M=1.71, SD=0.78) and the innovation piece (M=2.57, SD=0.81) t=<.01, p=<.05.

Voice

Voice relates to the ability to make the text come alive with interesting, vibrant and expressive writing. In the analysis of the independent-samples t-test, the results revealed a difference in the baseline writing piece (M=2.10, SD=0.94) to the intervention writing piece (M=2.76, SD=0.94) t=<.001, p=<.05.

Conventions

The evaluation of conventions relates to the ability to use correct capitalization, punctuation, spelling, and paragraphing. When examining the independent samples t-test on the trait of Conventions, there was a significant growth in this area when comparing the baseline writing piece (M=1.90, SD=0.89) and the innovation piece (M=2.95, SD=0.74) t=<.01, p=<.05.

Through this analysis, it was evident that there was growth in all six traits of writing. Appendix E shows one student's work from the baseline writing piece. Appendix F shows the same student's final intervention writing piece. Not only is the length much longer, the intervention piece shows a much stronger application of the Six-Traits of Writing. The most notable areas of growth for the students were in the traits of organization and conventions. This analysis demonstrates that students' writing skills improve by using a wiki in the elementary classroom. This is consistent with findings reported by Pifarre and Fisher (2011) who argued that students' writing can improve through the use of wikis.

Results From the Perceived Benefits and Challenges of Using a Wiki

To answer the questions of third grade students' perceived benefits and challenges of using a wiki during the writing process, the researcher examined data collected from the survey and field notes. After analyzing the data as shown in Appendix G, the researcher found commonalities in the responses of students.

Benefits

Regarding the student's perceptions about the benefits of using a wiki during writing, a few themes emerged. The survey revealed the students felt the wiki platform provided a platform for an increase in collaboration, writing skills, and motivation to write (See Figure 5).

From the data obtained in the survey, forty-four percent of the students responded that the best part of using the wiki was collaborating with their peers. This theme was the largest perceived benefit given by third grade students; therefore, revealing the students enjoyed using wikis because they are able to communicate and collaborate with one another in a social context.

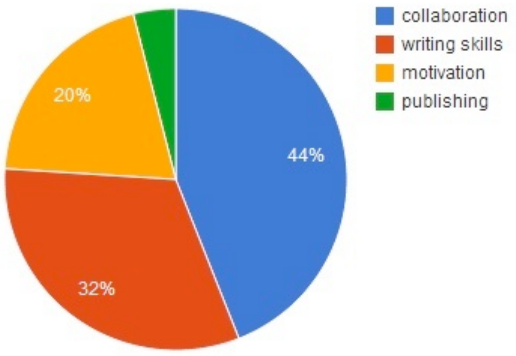

Figure 5. Benefits of using the wiki

The observational data also supported these findings, as the students were discussing how the wiki platform allowed them to get better ideas to make their stories better, as students were able to help each other out.

A conversation between Jen (pseudonyms) and the teacher supported the previous data. First, the student called the teacher over to her computer as she was confused on a discussion post that appeared on her screen and the following conversation evolved:

Jen: Someone just left me a message. Why are they writing on mine?"
Teacher: Check out what it says.
Jen: Oh, that is a good idea. (after reading through the discussion post)
Teacher: What is?
Jen: Eric just told me that I should add some details about my main character. (Field notes)

The data from the survey also revealed students' perceptions that the use of the wiki made their stories better. 32% of students responded that the best part of using the wiki was it improved their writing skills.

The field notes also supported students' perceptions that their writing skills were improved by the use of the wiki. One student was awed by her final product after using the wiki after recreating her initial story that did not include a main idea. "I rewrote my entire story. It wasn't on one topic at all before. Now it actually makes sense." A conversation recorded between Ryan and MacKenzie (pseudonyms) also supported this perception:

Ryan: I like having friends help me. It makes it easier to make my story better.
MacKenzie: My story is longer and better than before. Having people give me ideas sure helped me write.
Ryan: I agree. It is fun and it helps me write." (Field notes)

The previous statement supports the final theme presented in the data: the students were motivated to write on the wiki. Twenty percent of the students found using the wiki as fun and motivating to write. Many students mentioned that using the wiki was fun. One student said,

"This is so much better than writing on paper." This shows that students were motivated to write and found using the wiki as an enjoyable experience.

Challenges

After examining the data for benefits of using the wiki, the researcher also wanted to determine the perceived challenges of using the wiki for writing. The themes that emerged through this analysis were applying the writing process and skills into their own writing and understanding how to use the wiki platform. As shown in Figure 6, 63% of students found applying writing skills to be the most difficult aspect of using the wiki. One student wrote in the survey, "Well the most difficult thigs is to keep it on one subget." Most of these difficulties did not relate to using the wiki, but rather to learning to use the Six-Traits of Writing more effectively.

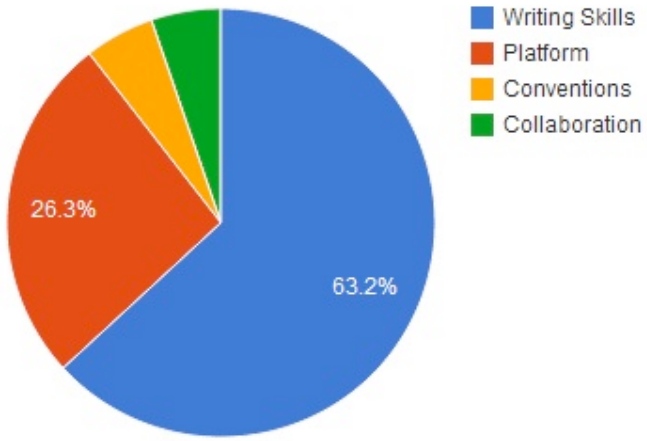

Figure 6. Challenges of using the wiki

The other common difficulty of using the wiki was learning all of the functions of the wiki platform. 26% of students responded in the survey that learning how to use the functions on the wiki to be the most difficult part of this project. Observations conducted while the students were working on the wiki also supported this statement. The learning curve of using the wiki was great in the first few days. Many students had difficulty figuring out how to create new paragraphs since the tab key was not usable in the wiki environment. One student made the statement, "I can't figure out how to make paragraphs. It isn't like our blogs. This is frustrating," when beginning to work on the wiki.

Learning how to use the wiki was an adjustment for some students, as was shown during observations of the students working on the wiki. In the following example, a student turned to the teacher when he was struggling with the platform of the wiki. Drew (psuedonyms) had signed into the wiki and was viewing the page he had authored as Jorie worked beside him on her own computer.

Drew: "Can I go to a different computer because this one isn't working? It won't let me write."
Teacher: Why won't it let you write?
Jorie then leaned over to the first student's computer and points to the edit button on the screen. Drew looked on as she explained how to make the page active.
Jorie: Push on edit. Then you can write. (Field notes)

From these data findings, it became evident that when teaching with unfamiliar technological tools, students may feel frustrated and need to become comfortable with the platform before students become proficient and productive. Many of the frustrations of using the wiki occurred within the first few days of working within the wiki environment when students were first becoming comfortable with the platform.

The other frustration of applying the Six Traits of Writing into their own writing pieces reveals the lack of writing skills many of these students possess. Many found composing the story to be very difficult, as well as applying the different traits while revising and editing their stories. Although this was a perceived difficulty of many students, students felt their changes in their writing were significant in this study as shown in the next section.

Changes in Writing

The researcher wanted to examine how the students' perceived how their writing changed by using the wiki. Overall, the common themes that emerged from the survey and field notes were improvement in their own writing skills and increasing the length of their stories (See Figure 7).

As the chart portrays, 64% of students felt that their ability to use the Six-Traits of Writing was the most significant change. When analyzing the students' perceptions of the

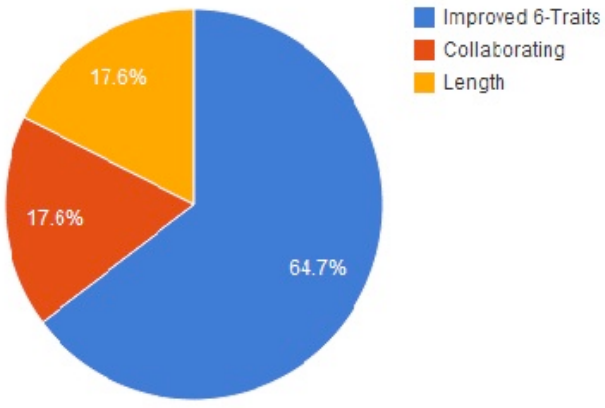

Figure 7. Changes in writing

changes, the researcher examined the specific traits represented in the student's responses in the survey. 33% of students reporting that their writing improved felt their overall writing piece became stronger. One student's response summarizes this perception of what they changed, "Well my hole story."

Other students were specific about which traits were improved. The trait with the largest perceived change was word choice. 33% of the students reported their largest improvement was relating to the trait of word choice. Another student's response on the survey explained the improvement of word choice, "I added more to the end and changed a lot of words so they would be more fun." Other traits that emerged for change were ideas and conventions, in which students recalled adding details and changing spelling, capitalization and adding punctuation.

Collaborating with peers was another theme that emerged on how students changed their writing. Seventeen percent of students responded by having students provide feedback to their writing, it helped make changes to their own writing. One student's response on the survey stated, "people can send you commets if somthing is not spelled write." Students responded to the comments suggested from their peers, especially when it related to conventions. Through observations, as soon as students would post on discussion boards, students would look at the comments and make changes accordingly as suggested from their peers.

Results of the Types of Feedback from Peers

To answer the third research question on how the feedback that third grade peers give, during the writing process, change with the use of a wiki compared to without the use of technology, the researcher analyzed surface level and text-based feedback in the baseline writing piece and the intervention piece.

By comparing the results of the baseline writing piece to the intervention piece, significant change in types of feedback became evident as presented in Appendix H. An independent-samples t-test was conducted to compare the frequency and types of feedback in the baseline writing piece to the intervention piece. An overall analysis of the feedback was conducted to determine whether differences existed that might be attributable to the intervention. When examining the independent samples t-test on the type and frequency of peer feedback, there was a significant difference between the baseline writing piece (M=1.33, SD=2.08) and the innovation piece (M=3.93, SD=4.77) t=<.01, p=<.05. The results were significant in the overall feedback from the baseline writing piece to the intervention piece; giving evidence that providing a platform that encourages peer interaction has positive results in the frequency of feedback given by peers.

Surface changes

When analyzing the data of the peer feedback of the baseline writing piece, students averaged a little more than one piece of feedback per writing piece. When examining the independent samples t-test on the type and frequency of surface level feedback, there was a significant difference between the baseline writing piece (M=2.14, SD=1.82) and the innovation piece (M=3.67, SD=2.90) t=<.01, p=<.05. The results were significant in the surface level feedback from the baseline writing piece to the intervention piece as the frequency of surface level feedback was greatly increased in the intervention writing piece. Students increased the number of times they provided feedback relating to spelling, punctuation, or changing of words on a surface level. Some might claim that the increase of surface level feedback is not beneficial, but it demonstrates the students were recognizing errors and applying their knowledge of editing.

Text-based changes

When examining the independent samples t-test on the type and frequency of text-based feedback, there was a significant difference between the baseline writing piece (M=0.52, SD=0.68) and the innovation piece (M=4.19, SD=3.39) t=<.01, p=<.05. The results were significant in the text-based meaning level feedback from the baseline writing piece to the intervention piece as the frequency was greatly increased in the intervention writing piece. These results show elementary students provided more text-based feedback, such as adding, deleting, substituting, restructuring and reversions, when using a wiki rather than when using only paper and pencil.

Implications

This small-scale research study provides evidence of the way a wiki environment can provide opportunities for elementary students to experience a platform that allows for the process of composition and revisions, emphasizing peer-feedback and the Six-Traits of Writing. The findings of this action research study suggest several implications.

First, it is clear using wikis in the classroom is an effective tool to increase the quality of writing for elementary students in a variety of ways. Since all Six-Traits of writing had significant growth with the use of the wiki, it implies providing the students the opportunity to write with technology and teaching with the Six-Traits in mind will improve the quality of student writing. In a previous study conducted by Englert, Manalo, and Zhao (2004), students produced similar results with significant growth in the writing traits of ideas, organization and conventions when using technology during writing. The two traits with the largest area of

growth were organization and conventions, which both needed much improvement from the baseline piece. It is important to note that organization was the lowest score in the baseline piece; therefore, when students read their work over many times on the wiki, as well as suggested and received feedback from their peers, they soon recognized ways to improve the organization of their own writing.

A second implication of the research is that the use of a wiki for writing is motivating for elementary students. Through the survey, classroom observations, and recent research on the topic, it is shown that students enjoy using wikis because they are able to communicate and collaborate with one another in a social context. Similar to the study conducted by Woo et al. (2011), elementary students in this study enjoyed the educational affordances such as improving their writing skills, but emphasized the social and collaborative affordances as being their favorite part of the study.

A third implication of this study is that the wiki platform highlighted the need for students to become more critical of their own writing, as well as their peers' writing. Each time students provided feedback to each other in the wiki environment, it provided the opportunity for the author to read their text and analyze their own writing. Every time students left feedback for their peers, it provided an opportunity for students to edit and think about the Six Traits of Writing in an authentic writing experience. By empowering students with an authentic experience to edit and revise writing, students took more ownership in the improvement of their writing and their peers' writing pieces.

The last implication of this research is the quantity and quality of peer-feedback is increased with the use of a wiki. Students were more likely to give peers feedback about their writing on the wiki than with paper and pencil. In this study, students increased their frequency

of feedback in both surface and text-based level; therefore, students became more aware of how to evaluate and revise to improve the quality of writing. From this study, it is implied that elementary students were able to use higher order thinking skills when revising, although the study conducted by Dix (2006) claimed that elementary students have not developed the cognitive ability to make content area revisions in their writing, nor recognize the need for revision. The study conducted by Pifarre and Fisher (2011) suggests students in elementary were able to access the full number and distribution of revisions when an appropriate learning environment is provided. Since students were able to make text-level contributions to their peers, the results from this small scale action research project contrast Dix's (2006) results and support Pifarre and Fisher's (2011) study; therefore, more research in this area would be appropriate.

Action Planning

The conclusions drawn in this work, as well as in previous research, present the wiki environment as a positive and effective pathway to develop writing skills, collaboration, and motivation to write at the elementary level. The outcomes from this action research study produced positive results, in which wikis can be used as an effective means to increase writing skills; therefore, it is essential to move into the next cycle of this action research plan.

Reporting findings

To complete the next steps of the cyclical process, reporting the findings to stakeholders will be the first essential component to further this research. Internal stakeholders, such as the principal, superintendent, and Professional Learning Community teams, will be informed of the

results found in this action research project to prove the effectiveness of using technology in the curricular areas at the elementary level.

The teacher-researcher will share the results with the third grade Professional Learning Community team, before the end of the school year, as they were looking for ways to improve the quality of writing of third graders. By sharing these findings with the third-grade team, an understanding of the impact technology can play in the writing curriculum can be discovered. From this sharing, a plan can be developed and implemented on how to infuse wikis into the third grade writing curriculum. The researcher is becoming the district technology coach for the following year, rather than being a classroom teacher, so the researcher will set up the wiki environment for the third grade teachers, as well as implement and co-teach this unit with the third grade teachers next year.

In addition, the researcher will also share the results with the fourth grade Professional Learning Community team, to see if they are willing to participate in further exploration of the Six-Traits with fourth graders for next year. This will enable to researcher to discover how writing skills can change over a longer period of time, such as an entire school year rather than just a month unit. If they are willing to participate, the teacher-researcher will work with the team action-plan approach to set up a wiki environment, cooperatively teach a unit in writing, and help evaluate student work next year.

Next steps of the cyclical process

Based upon this investigation and after considering the implications of this research, there are a few additional questions left to be explored. These questions were used to develop the next cycle of the action research plan.

First, this study did not reveal the students' awareness of the Six-Traits. Many students were unsure what to title their discussion posts when providing feedback to their peers. They realized what needed to be changed, but did not appear to know what trait was being identified in their posts. If a similar study was conducted again, it would be beneficial to see if students could identify the components of each of the Six-Traits. A pre-test and post-test could be conducted to see the knowledge of the Six-Traits, since this is writing is evaluated within the school district. Also, students could apply this knowledge by labeling which of the Six-Traits they were suggesting for improvement each time they provided feedback to each other. For example, if a student suggested a change in spelling, they would label their discussion post with conventions. By conducting this study, it may make students more aware of the components of each trait.

If the researcher would have continued as a classroom teacher, she would have conducted the next cycle of research as described above, as an individual action plan, which students would do a similar activity as the previous research but would also be evaluated on their knowledge of the Six-Traits of Writing. Since the researcher's role has now changed, she will suggest this next step with the third grade Professional Learning Team, as a way to further explore the effectiveness of the identification and application of Six-Traits of Writing within the wiki platform.

Another question left unexplored is the long term effect of using wikis. With the change in the researcher's position, the area of long term effects of using a wiki can be examined. The next phase of this cyclical research project would be to create a team action plan with the fourth grade teachers. Then, as a team, they would conduct a study of the long term impact of using a wiki in writing with fourth grade students: some which participated in this study, mixed in with students who had not experienced the wiki environment this year. It would be interesting to find

out if students who used the wiki platform gave different or more thorough feedback about their peers' writing than those who had not had previous experience with the wiki. It would also be important to discover how writing skills changed over a longer period of time, such as an entire school year rather than just a month unit. The analysis of the change in the Six-Traits, from the beginning of the year to the end of the year, would be important to see if the results would be long-term rather than just applied in one unit. The researcher could just be the observer, rather than the teacher too; therefore, focus solely on the data instead of the curriculum which could produce more detailed results.

Challenges

One challenge with making the next steps of this action plan come into action is the lack of technological resources available for the students in this district. Since there are only three labs available for all students in grades two through five, scheduling the lab for three to four consecutive hours, for each class to work on the project on a regular basis will be a challenge. To alleviate this challenge, more computers will need to become available for student use. The district has plans to increase the number of technological resources in the near future to include ipads, computers, or tablets.

The other challenge teachers face is the time needed to determine if they are using effective practices. An action research project requires an abundance of time and energy, which most educators do not have to further explore their practice. Through this study, the researcher now understands the importance of an effective action research project and the process of conducting a study such as this. As most teachers do not have the time to conduct action research projects within their classrooms, part of the researcher's new job description as the technology

coach, will be to develop effective teaching practices with technology. Time will be built in the researcher's day to work with teachers to develop action research plans which will alleviate some of the time challenges faced by the classroom teacher at all levels.

Reflections

The intentions of this action research study were to explore how technologies, such as wikis, can impact the writing of elementary students. Through this study, the researcher was able to explore an effective pathway for developing writing skills. The researcher intends to continue learning and discovering other technological tools that can be integrated into curricular areas in the kindergarten through secondary settings. The district has developed a technology plan, with one component focusing on changing teacher perceptions of using technology as an add-on item to creating curricular units with technology infused to create, collaborate, and problem solve.

From this priority, the researcher plans to lead this district-wide change by collaborating with Professional Learning Community teams, across the district, to develop units that incorporate technology in effective and productive ways. By providing this action research project as an example of how technology can be proven to be effective in providing positive growth in students' curricular areas, it will be a starting point for others to see the effectiveness of technology in their curricular focus area.

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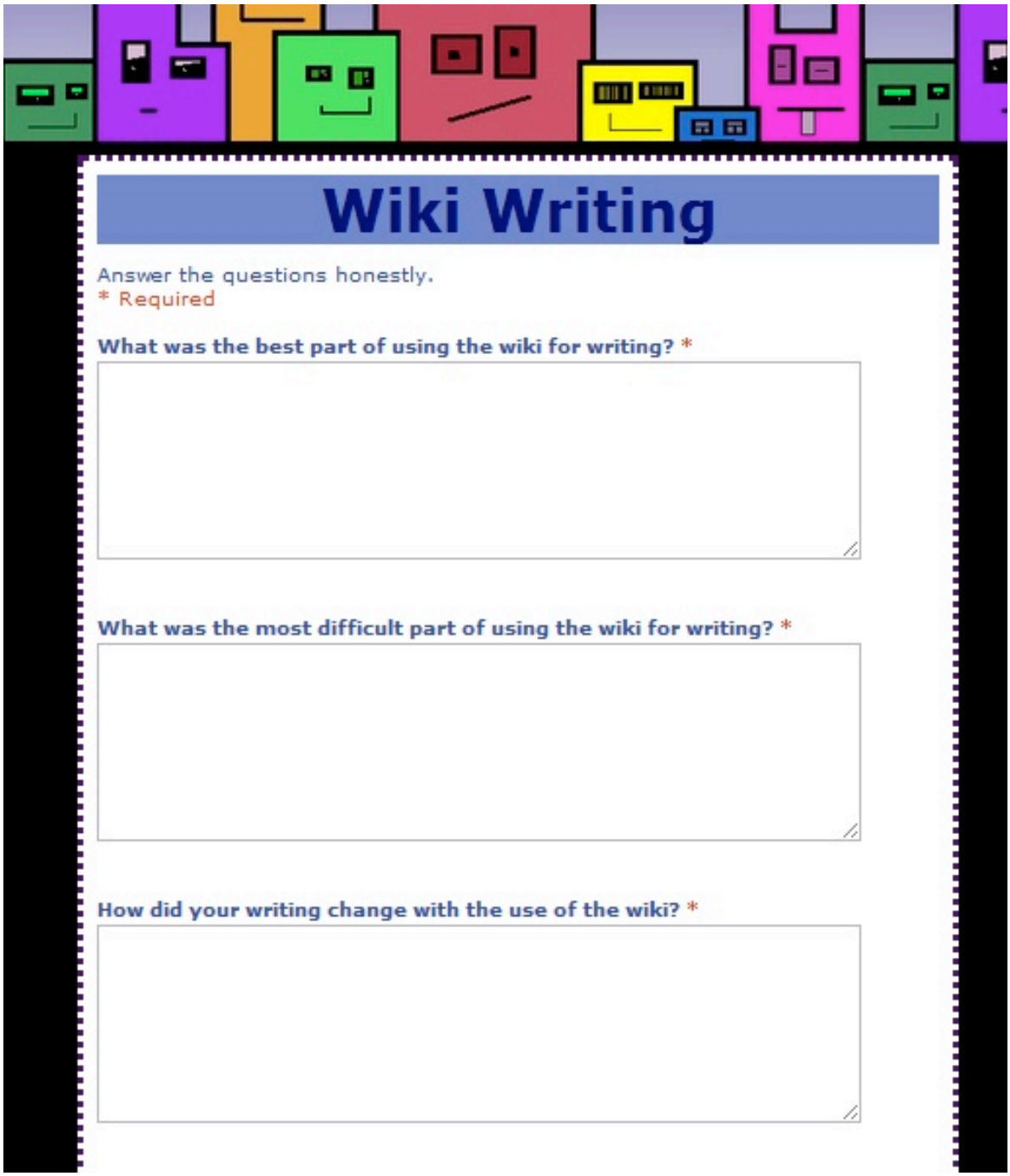
Appendix A: Six-Traits Rubric

6+1 Trait Writing Model : Fantasy Story

CATEGORY	4	3	2	1
Ideas	*Main idea is well developed *Content is clear and focused *The right number of appropriate details	*Easy to tell the main idea *Most of the time the content is clear and focused *Reader still figuring things out	*Main idea present but needs work *At times content is clear and focused *A few details *Some unneeded information	*Main idea not clear *Content is confusing * Not enough details *Lots of unneeded information
Organization	*Strong beginning *Smooth transitions, easy to follow *Order makes sense *Effective writer's ending	*A writer's lead, but could be better * Transitions are repetitive *Order makes sense at times *A writer's ending, but needs to be more effective	*A weak writer's lead *Transitions are weak *Some order, but the writing is confusing *There's a weak ending	*No identifiable beginning *Transitions missing *Order of details is random *No ending.
Word Choice	* Words are specific and accurate * Creates imagery for reader Lively verbs and nouns	*Most words used correctly *Most verbs and nouns are strong *At times over description buries reader in details	*Some words used correctly *Some strong verbs and nouns *Thin description *Over-reliance on passive verb tense	*Word are broad and do not work * Language is used incorrectly * Limited vocabulary, misuse of parts of speech *Unimaginative
Voice	*Lively *Writing is expressive engaging, energetic *Writer takes a risk with revealing details	*Voice acceptable for topic, purpose, audience, but no life *Pleasant & agreeable *reflects limited individual perspective	*Some voice *Writing distant, overly formal or too informal *Can't seem top hit the right tone	*No voice *Writing boring, & stiff * Writer doesn't care about the audience
Sentence Fluency	*Joy to read aloud *Sentences vary in length and structure *Structure, rhythm and flow match the purpose	*Some sentence variation, still basic *Can be read aloud but lacks rhythm *If there are fragments there's a purpose	*Most sentences begin the same way *Sometimes needs to be re-read *Still fragments, run-ons that interfere with flow	*Hard to read aloud *Reader must stop and re-read to get meaning *Run-ons and fragments
Conventions	*Few errors, can read right over them *Excellent attention to capitals, grammar, usage, paragraphing. * Ready to publish	*Some errors, but doesn't detract from meaning *Reasonable attention to capitals, grammar, usage, punctuation, spelling *Light editing needed	*Errors detract from meaning *Some attention to capitals, grammar, usage, punctuation, spelling. * Moderate editing needed	*Errors interfere with meaning * No attention to capitals, grammar, usage, punctuation, spelling *Needs much editing

Appendix B: **Survey Questions**



Wiki Writing

Answer the questions honestly.
* Required

What was the best part of using the wiki for writing? *

What was the most difficult part of using the wiki for writing? *

How did your writing change with the use of the wiki? *

Appendix C: Field Notes

Day 1:

"This is so much better than writing on paper."

"How come spell check doesn't work on this?"

"I don't know what to do. I can't remember what I wrote before."

"What should you do? What could you do?" (teacher)

"Just make it up as I go?"

"Sure." (teacher)

"Can I go to a different computer because this one isn't working? It won't let me write." Another student leans over to the first student's computer and tells them, "Push on edit. Then you can write."

"Is this good?" (as she was writing a comment to another student)

"Did you see this? I didn't know you could do that." (showing another student how to add a picture to his story)

"_____ just left me a discussion. Cool."

"How do I spell capitalize?" (Another student leans over and types it in on the first student's computer)

"I don't know what to write next."

"You could ask for help on the discussion posts." (teacher)

Another student walks over to the first student's computer and reads the story. Tells him to add some details to this story. Then says, "What is going to happen next?"

They have an unaudible conversation and then the first student starts writing and the other student returns to his seat.

"Mrs. _____, what do I do when I am done?"

"Someone just left me a message. Why are they writing on mine?"

"Check out what it says" (teacher)

After looking at the message, "Oh, that is a good idea."

"What is?" (teacher)

"_____ just told me that I should add some details about my main character."

"Let's see _____'s story. He needs to stay on one topic."

"I know I need to capitalize and add punctuation. Not everyone needs to tell me."

Day 2

"Oh no. Everything is gone."

"Did you delete it?" (teacher)

"I didn't mean to, but it went away when I logged out yesterday."

"Just go to history and you can get it back up." (Student leans over and shows him how to do this).

"Oh thank you. I was scared that it was all gone."

"Remember to look at your discussions because I just left a bunch." Everyone immediately started looking to their discussion posts to see if they had any new ones.
"Man, no one has left me any comments."
"I will. Just give me a second. I am writing on someone's else's right now."
After a few minutes, "Awesome. I now have three discussions going. This helps."

"This is awesome. _(name)_ is giving me great ideas."

"I can't figure out how to make paragraphs. It isn't like our blogs. This is frustrating."

"People keep trying to give me help while I am still working on my story and it won't let me save then."

"I am trying to post a comment. Is this how I do it?" Another kid leans over and touches the screen to show him how to do it.

"I don't know how to capitalize words. What button do I push?"

"Can your neighbor show you how to do this?" (teacher)

"_____, will you show me how to capitalize?"

Student walks over to the computer, points to the caps lock button. Other neighbor says, "No, just push the shift key by the enter button. Then you don't have to turn the caps lock off."

First student tries the shift button but doesn't hold it down with the letter he was trying to capitalize. "The shift button doesn't work."

Student who suggested it leans over and pushes the shift button down and asks what letter he wants capitalized and just does it for him.

"Which students are done? I don't want to comment on people's who aren't done writing yet."

"Do I have to use everyone's ideas on their discussion posts?"
"What do you mean?"
"Well, there are some ideas I like and want to use but there are some that I don't think make sense with my story."
"Use what you like" (student sitting beside first student)

Day 3

"I like having friends help me. It makes it easier to make my story better."
"My story is longer and better than before. Having people give me ideas sure helped me write."
"I agree. It is fun and it helps me write."

"Can I go to the room to get a dictionary?"
"Why?"
"Because I don't know how to spell a word."
Neighbor leans over and shows the first student how to right click on the word and how the computer gives suggested words.
"This is awesome. There's my word."

Student leans over to another student's computer and points to the screen. "You need to capitalize your first word." Student does but isn't sure why. Neighbor tells him, "Because every sentence needs to have a capital."
"Yeah, because of the period, I need a capital."

"Remember when I stands alone, it needs to be capitalized."

"I rewrote my entire story. It wasn't on one topic at all before. Now it actually makes sense."

"My story was only one paragraph before, now it is almost an entire page."

"Look how much longer my story is now!"

Appendix D: Six-Trait Results

Six Traits Writing Results														
STUDENT	Pre - IDEAS	Post - IDEAS	Pre - ORG	Post - ORG	Pre - WORD CHOICE	Post - WORD CHOICE	Pre - VOICE	Post- VOICE	Pre - SENT FLUENC	Post - SENT FLUENC	Pre - CONV	Post - CONV	PRE TOTAL	POST TOTAL
Student 1	1	4	1	4	2	4	2	3	2	3	2	4	10	22
Student 2	2	3	1	2	2	3	1	2	1	2	2	3	9	15
Student 3	1	2	1	3	1	1	1	2	1	3	1	2	6	13
Student 4	3	4	4	4	3	4	3	4	4	4	3	4	20	24
Student 5	2	2	2	3	2	3	2	3	2	2	3	3	13	16
Student 6	2	3	2	4	3	4	4	4	2	4	2	3	15	22
Student 7	1	1	1	2	2	2	2	2	1	2	1	2	8	11
Student 8	1	1	1	1	1	1	1	1	2	2	2	3	8	9
Student 9	1	2	1	2	1	3	1	2	1	2	3	3	8	14
Student 10	1	1	1	2	2	2	2	2	1	1	1	2	8	10
Student 11	1	2	1	2	1	2	1	1	1	2	1	2	6	11
Student 12	1	3	1	2	2	3	3	3	2	3	1	3	10	17
Student 13	1	4	1	3	2	4	1	3	1	3	1	4	7	21
Student 14	3	4	2	4	2	3	3	4	2	3	2	3	14	21
Student 15	2	3	1	3	1	3	2	3	1	2	1	3	8	17
Student 16	1	1	1	2	2	4	2	3	2	3	2	2	10	15
Student 17	1	1	1	2	3	3	2	3	2	2	1	2	10	13
Student 18	2	3	1	3	3	4	4	4	3	4	4	4	17	22
Student 19	1	2	2	3	2	2	2	2	1	2	3	4	11	15
Student 20	2	3	3	3	2	3	2	3	2	2	2	3	13	17
Student 21	2	3	1	2	2	3	3	4	2	3	2	3	12	18
Mean	1.52	2.48	1.43	2.666	1.95	2.90	2.10	2.76	1.71	2.57	1.90	2.95	10.61	16.33
Median	1	3	1	3	2	3	2	3	2	2	2	25	10	16
Mode	1	3	1	2	2	3	2	3	2	2	2	3	8	15
Max	3	4	4	4	3	4	4	4	4	4	4	4	20	24
Min	1	1	1	1	1	1	1	1	1	1	1	2	6	9
SD	0.679	1.08	0.81	0.856	0.67	0.94	0.94	0.94	0.78	0.81	0.89	0.740	3.65	4.40
T Test		<.001		<.001		<.001		<.001		<.001		<.001		<.001

Appendix E: Student Baseline Example

Butey

Once there lived a kid named Butey and her mom's name was Bella and Bob last of all was her little sister Beatrict.The town town calls them the B family why because they all had B's in there name.Everybody loved them but the kid he pisherd no one was there his name name is Chris. He was sad all the all the time,I'd not know why he was sad maybe he had no friends.One day I asked him if he want to play he said no I ask why and he stared to cry.chris was nine years old and in third grade.He said i think my brother died when he was 3 years old. From what? I asked well he died from getting shot by a kid named Jacob he was fifteen years old.Butey said in a low voice.Ya he said.in a calm voice.There is someone behind you. WHAT! Yelled Chris it was his dad hey kids guess what,what your brother is not dead. how do u know we dont have a t.v.What is your brothers name Butey asked?His name is kordell ok I will try to find him a the news I said.Bella Buteys mom yelled time to eat ok I said! Bye I said then Chris asked his dad were he was; well I had not found him yet.When will we find him I asked I dont know Chris's dad said.Then the b family came running out and said did u see on t.v well Chris said we dont have a t.v oh but your brother in a well in Mississppi people are trying to get him out let go.Then they got in there car and went to Mississppi and tryed to get him out then Beatrict went to the cops they went to the firedeparmet they came we all pulled and pulled.The ammulet arived they said he had a broken arm and ribs.He went home two days later.Bella payed for it all and they all went to out to dinner. Chris was happyer then ever to have Kordlle.Kordlle made new friend. kordlle had a robot arm he can play sport summer came and a jesment were hard but happy.Te b family loved been nabers.Then the B family said they where moving to Iowa.They where sad can we still be friends? Of corce we can they said. When do you leave?Next week. Who is moving in your house?My gadpa and grama cool I know. Ya summer is gone and school is here.One day there, partents put up a video chat up for them

Appendix F: Intervention Example

Aliens at the Church

Once there lived a nine year old girl named Beauty who lived in Lost California. She had blond hair and was 5 feet tall. Her favorite thing to do was to hang with friends and ride her bike. Beauty's best friend was a boy named Chris. Chris had blue hair and wore pink skinny jeans. One day Beauty and Chris went for a bike ride down a gravel road by the old church. When they got close to the church, they heard all of these weird noises. Church was not going on. The noise was coming from behind the church. They leaned their bikes up against the church, peeked around the corner, and saw a green light coming from a well.

When they saw the light, they turned to each other with a frightened look on their face. They jumped back on their bikes and took off to the police station.

After talking to the police, they rode with the police in a patrol car out to the old church. Beauty and Chris stayed by the patrol car while the police went to investigate. When they looked in the well, nothing was there. The police officers came back to the car and asked if they kids were playing a trick on them. Beauty and Chris said that they never lie about things when they see it.

The police took the kids back to town not believing them. Beauty and Chris wanted to prove that they weren't lying so they made a plan.

Beauty and Chris got together after school at Chris' house. They used a white board to draw out their plan. Their plan was to keep bay around the well and use a camera by they church to prove that something was out there. Chris went out to the garage and grabbed his dad's rope. Beauty ran home, snuck into her mom's room, and took her video cameras. She raced back to Chris' house so her sister wouldn't see her.

At 10:00, when everyone was asleep Beauty and Chris rode their bikes back out to the church. They hung one camera by the rope on the corner of the church. They also put bait of candy around the well. Then, they threw a rock at a window and broke the glass. Chris climbed inside and came around the front of the church to open the door for Beauty.

They decided to just close their eyes to see what would happen next. Nothing happened for a long time and the kids started to doze off.Then at 2:20a.m. they heard a weird noise a sec later they heard it again and then it was silts.

Then they wake up and went to see if any thing was there. They looked but nothing was there.Chris said I better get home so they left.They got together again at the same time at the same place.

This time the bait was gold,they reset the video cameras at 4:00 they went to the church and they brought food and pillows and blakens. Chris ask Beauty why we where doing this she did not answer,are you ok asked Chris.'ya' ok.

I went to the old church we put out the bait lad out the blackens and pillows. Then we went to bed then at 4:32 we seen somthing we dont know what it is.Lets go look and seen whisper Chris but Beauty was still asleep so Chris went on his own.

Then Chris seen that thing again he lad back down and closed his eyes.

Then he look up and saw nothing nothing at all.Then it was moning they ate breakest and then they saw somthing!

It was the allien it was What said Chris the allien yell Beauty! Now the the cops have to beleave us. They showed the cops the said they still dont beleave them! Chis said come on you have to beleave me I wont beleave it untill I see it for myself said the cops.

Chris and Beauty really wanted to see it so they told the cops to stay there with them so they would know they weren't lying. So, they stayed there and they saw a green light appear as they were talking to each other in the parking lot. Beauty was the first to see it. She couldn't say anything because she was so frightened, but she pointed over to the light. The cops quickly turned around and the light was gone.

The cops walked to the back of the church and the kids went around on the other side. When they got to the back, they saw slime all over the ground leading from the back door of the church to the well. They went inside the church and they saw a red light glowing from a little closet. The cops opened up the closet and there was an alien's face staring back at them. The face was green and it's eyes were glowing blue. The cops turned around and ran out of the church before the kids could see it. The cops finally went back in and opened the closet door once again and instead of finding the face or slime, they saw an alien's mask. It looked different than the face they saw before.

The cops told the kids to just go home. The kids went to Beauty's house and they realized her parents were not home. They went up to Beauty's room and they saw a can of gel that looked just like the slime they saw at the church sitting on her mom's dresser. They went back downstairs and they saw drops of the slime on the floor leading out the door. They followed the drops and they led all of the way back to the gravel road where the old church is located.

They went back to the church to tell the cops that their parents weren't home. When they got there, they heard laughter coming from upstairs in the church. They crept up the stairs and they saw the mask sitting on the floor. When they looked up, their parents were looking right back at them.

Beauty asked, "Why are you here?"

Her mom said, "You kids thought you were real funny sneaking out at night. Your sister told me that you ran out of the house with my video cameras so I followed you out here. I knew you two were up to no good so I bought this gel and mask to trick you back. Do you really think there would be an alien coming down to Earth?"

They all got a good laugh out of it all and finally they walked home. On the way home, Beauty asked, "Well, what was that light the first night we were there?"

Everyone looked at her curiously, "What do you mean light?"

Chris looked at their parents and said, "If it wasn't you, then who was it?"

That mystery was left unsolved by the police, the kids, and the parents.

Appendix G: Survey Analysis

BEST PART OF USING THE WIKI

Writing Skills/6 traits

- is that every body gives you good ideas.
- describe there story better
- the story
- Writing the story
- writeing
- Well it helps you to in prove your writing
- The most fun part about wiki is that you can write anything you want. You can write about animals, people, aliens, monsters, and a lot of other stuff.

Collaboration

- Helping my class mates.
- you can write commets
- To help kids with there writing
- was having my class mates give me ideas.
- that people could do diskushan post.
- Commenting on other people's story.
- coment
- Friends can give ideas to each ether
- you can help people on theres stor if you are done
- I think the best part of using wikispaces was comments!!
- “I like having friends help me. It makes it easier to make my story better.” (field notes)
- “My story is longer and better than before. Having people give me ideas sure helped me write.”

Motivation

- its fun
- “This is awesome” - (field notes)
- “This is so much better than writing on paper.” (field notes)

CHALLENGES OF USING THE WIKI

Writing Skills/Writing Process

- is writing the biginng.
- cretting my story.
- How to write my story
- changing my story.
- To make shere you have retelling.
- Changing it.
- Writing the story.
- writeing
- WRITING THE STORY!
- Well the most difficult thigs is to keep it on one subget.
- the hard words
- I think the most difficult part of using wikispaces is was the words.
- all the miss spelling and caps

Platform

- somtimes you mess up by pushing two buttons at the same time.
- typing the words.
- The most difficult part about using the wiki is that you have to learn to use the controls.
- to use parographs.
- “I can’t figure out how to make paragraphs. It isn’t like our blogs. This is frustrating.” (field notes)
- “People keep trying to give me help while I am still working on my story and it won’t let me save then.” (field notes)
- “How come spell check doesn’t work on this?” (field notes)
- “I wish there was one of those dictionary things on here that tell you words that mean the same thing.” (field notes)

HOW WRITING CHANGED WHEN USING THE WIKI

Writing Skills

- Like how to make my story better
- pepole comment and it make your story a lot better.
- Chaging the be gining of the sentis.
- Changing the words.
- putting up diffit words from the paper story.
- I added details with my sorer.
- i change the words
- I added more to the end and changed a lot of words so they would be more fun.
- Well my hole story.
- people can send you commets if somthing is not spelled write.
- “I rewrote my entire story. It wasn’t on one topic at all before. Now it actually makes sense.” (field notes)
- “My story is longer and better than before. Having people give me ideas sure helped me write.”

Presentation

- it made my hande writing look good.

Length

- I made it longer.
- Makeing it longer
- made it longer
- “Look how much longer my story is now!” (field notes)
- “My story was only one paragraph before, now it is almost an entire page.”
- “My story is longer and better than before. Having people give me ideas sure helped me write.”

Appendix H: Types of Revisions

n=21	Baseline Writing Piece			Intervention Piece		
STUDENT	Surface	Meaning	TOTAL	Surface	Meaning	TOTAL
Student 1	5	1	6	3	7	10
Student 2	2	0	2	3	2	5
Student 3	1	0	1	10	2	12
Student 4	1	0	1	3	6	9
Student 5	2	0	2	1	1	2
Student 6	0	0	0	1	2	3
Student 7	1	0	1	3	11	14
Student 8	0	0	0	4	1	5
Student 9	6	1	7	0	2	2
Student 10	1	1	2	1	5	6
Student 11	6	1	7	5	8	13
Student 12	1	2	3	3	8	11
Student 13	1	2	3	5	2	7
Student 14	3	1	4	7	5	12
Student 15	1	1	2	9	1	10
Student 16	3	1	4	8	12	20
Student 17	2	0	2	5	4	9
Student 18	0	0	0	1	2	3
Student 19	3	0	3	0	5	5
Student 20	4	0	4	1	1	2
Student 21	2	0	2	4	1	5
Mean	2.14	0.52	1.33	3.67	4.19	3.93
Min	0	0	0	0	1	2
Max	6	2	7	10	12	20
SD	1.82	0.68	2.08	2.90	3.39	4.77
t-test				t=<.01	p= <.05	